What is claimed is:

1. A 2x2 optical switch comprising:

a first port adapted to receive an optical input and generate an optical output;

a second port adapted to receive an optical input and generate an optical output;

a switching component group including a polarization switch ;

a first component group coupled between the first port and the switch component group;

a second component group coupled between the second port and the switch component group;

wherein,

when the polarization switch is disabled, the switch component group being adapted

to convert one or more light beams exiting from the first component group with a first chosen polarization into one or more light beams reentering the first component group with the first chosen polarization, and

to convert one or more light beams exiting from the second component group with a second chosen polarization into one or more light beams reentering the second component group with the second chosen polarization, and

when the polarization switch is enabled, the switch component group being adapted

to convert one or more light beams exiting from the first component group with the first chosen polarization into one or more light beams reentering the second component group with the second chosen polarization, and

to convert one or more light beams exiting from the second component group with the second chosen polarization into one or more light beams reentering the first component group with the first chosen polarization.

2. The 2x2 optical switch of claim 1, wherein

the first component group is adapted to receive the optical input from the first port and generate two light beams with the first chosen polarization entering the switch component group, and to receive two light beams with the first chosen polarization from the switch component group and generate an optical output to the first port; and

the second component group is adapted to receive the optical input from the second port and generate two light beams with the second chosen polarization entering the switch component group, and to receive two light beams with the second chosen polarization from the switch component group and generate an optical output to the second port.

3. The 2x2 optical switch of claim 1, wherein the polarization switch comprises a mirror.

4. The 2x2 optical switch of claim 1, wherein the polarization switch comprises a liquid crystal cell sandwiched between two transparent conducting plates.

5. The 2x2 optical switch of claim 1, wherein the polarization switch comprises a Faraday rotator modulated by a magnetic filed.

6. The 2x2 optical switch of claim 1, wherein the first component group comprises
a first birefringent material;
a structured half wavelength plate coupled to the first birefringent material;
a second birefringent material coupled to the structured half wavelength plate;
a half wavelength plate coupled to the second birefringent material; and
a Faraday rotator coupled to the half wavelength plate.

7. The 2x2 optical switch of claim 1, wherein the first component group comprises
a first birefringent material;
a structured half wavelength plate coupled to the first birefringent material;
a second birefringent material coupled to the structured half wavelength plate;
a Faraday rotator coupled to the second birefringent material; and
a half wavelength plate coupled to the Faraday rotator.

8. The 2x2 optical switch of claim 1, wherein the switch component group comprises

a reflector coupled to the first switch component group;

a polarization beam splitter coupled to the second switch component group, the reflector and the polarization switch.

9. An optical switch comprising:

a first port adapted to receive an optical input and generate an optical output;

a second port adapted to receive an optical input and generate an optical output;

a switching component group including

a reflector,

a polarization beam splitter coupled to the reflector, and

a polarization switch coupled to the polarization beam splitter;

a first component group coupled between the first port and the reflector in the switch component group; and

a second component group coupled between the second port and the polarization beam splitter in the switch component group.

10. The optical switch of claim 9, wherein

the first component group is adapted to receive the optical input from the first port and generate one or more light beams with a first chosen polarization entering the reflector in the switch component group, and to receive one or more light beams with the first chosen polarization from the reflector in the switch component group and generate an optical output to the first port; and

the second component group is adapted to receive the optical input from the second port and generate one or more light beams with a second chosen polarization entering the polarization beam splitter in the switch component group, and to receive one or more light beams with the second chosen polarization from the polarization beam splitter in the switch component group and generate an optical output to the second port.

11. The optical switch of claim 9, wherein the polarization switch comprises a mirror.

12. The optical switch of claim 9, wherein the polarization switch comprises a liquid crystal cell sandwiched between two transparent conducting plates.

13. The optical switch of claim 9, wherein the polarization switch comprises a Faraday rotator modulated by a magnetic filed.

14. The optical switch of claim 9, wherein the polarization switch includes an optical filter.

15. The optical switch of claim 14, wherein the optical filter is a tunable optical filter.

16. The optical switch of claim 9, wherein the first component group comprises
a first birefringent material;
a structured half wavelength plate coupled to the first birefringent material;
a second birefringent material coupled to the structured half wavelength plate;
a half wavelength plate coupled to the second birefringent material; and
a Faraday rotator coupled to the half wavelength plate.

17. The optical switch of claim 9, wherein the first component group comprises
a first birefringent material;
a structured half wavelength plate coupled to the first birefringent material;
a second birefringent material coupled to the structured half wavelength plate;
a Faraday rotator coupled to the second birefringent material; and
a half wavelength plate coupled to the Faraday rotator.

18. The optical switch of claim 9, wherein the second component group comprises
a first birefringent material;
a structured half wavelength plate coupled to the first birefringent material;
a second birefringent material coupled to the structured half wavelength plate;
a half wavelength plate coupled to the second birefringent material; and
a Faraday rotator coupled to the half wavelength plate.

19. The optical switch of claim 9, wherein the second component group comprises
a first birefringent material;
a structured half wavelength plate coupled to the first birefringent material;
a second birefringent material coupled to the structured half wavelength plate;
a Faraday rotator coupled to the second birefringent material; and
a half wavelength plate coupled to the Faraday rotator.

20. An optical switch comprising:
a first port adapted to receive an optical input and generate an optical output;
a second port adapted to receive an optical input and generate an optical output;
a switching component group including
a reflector,
a polarization beam splitter coupled to the reflector, and
a polarization switch coupled to the polarization beam splitter;
a first component group including
a first birefringent material coupled to the first port,
a structured half wavelength plate coupled to the first birefringent material,
a second birefringent material coupled to the structured half wavelength plate, and
a polarization component subgroup including a coupled half wavelength plate and a Faraday rotator, the polarization component group coupled between the second birefringent material and the reflector in the switching component group; and
a second component group including
a first birefringent material coupled to the second port,

a structured half wavelength plate coupled to the first birefringent material,

a second birefringent material coupled to the structured half wavelength plate, and

a polarization component subgroup including a coupled half wavelength plate and a Faraday rotator, the polarization component group coupled between the second birefringent material and the polarization beam splitter in the switching component group.

21. An optical switch comprising:

a first port adapted to receive an optical input and generate an optical output;

a second port adapted to receive an optical input and generate an optical output;

a switching component group including

a reflector,

a polarization beam splitter coupled to the reflector, and

a polarization switch coupled to the polarization beam splitter;

a first component group coupled between the first port and the reflector in the switch component group and including a non-symmetrical device; and

a second component group coupled between the second port and the polarization beam splitter in the switch component group and including a non-symmetrical device, wherein each of the non-symmetrical devices allows for a traversal of light beams along different paths in a respective component group when the light beams pass round trip through the respective component groups.

22. An optical component comprising

a first birefringent material;

a structured half wavelength plate coupled to the first birefringent material;

a second birefringent material coupled to the structured half wavelength plate;

a half wavelength plate coupled to the second birefringent material; and

a Faraday rotator coupled to the half wavelength plate.

23. The optical component of claim 22 wherein the structured half wavelength plate coupled to the first birefringent material plate through a wedge.

24. The optical component of claim 22 wherein the structured half wavelength plate includes two regions of half wavelength plates placed diagonal to each other and two regions of transparent plates placed diagonal to each other.

25. An optical component group comprising:

a first birefringent material;

a structured half wavelength plate coupled to the first birefringent material;

a second birefringent material coupled to the structured half wavelength plate;

a Faraday rotator coupled to the second birefringent material; and

a half wavelength plate coupled to the Faraday rotator.

26. The optical component of claim 25 wherein the structured half wavelength plate coupled to the first birefringent material through a wedge.

27. The optical component of claim 25 wherein the structured half wavelength plate includes two regions of half wavelength plates placed diagonal to each other and two regions of transparent plates placed diagonal to each other.